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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,408	07/25/2001	Kenji Inage	110199	4088

25944 7590 10/18/2005

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EXAMINER

MILLER, BRIAN E

ART UNIT PAPER NUMBER

2652

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/911,408

Applicant(s)

INAGE ET AL.

Examiner

Brian E. Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5,10,15 and 20-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-40 is/are allowed.
- 6) ☒ Claim(s) 5,10,15 and 20-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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Claims 5, 10, 15, 20-40 are now pending.

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/27/05 has been entered.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 5, 10, 15, 20-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al (US 6,587,315). As per claims 5 & 15, Aoki et al discloses an MR device, as shown in at least FIG. 1, including: a MR element 16 which includes a multilayer of elements 10-15, having two surfaces that face toward opposite directions and two side portions that connect the

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two surfaces to each other; two bias field applying layers 17 that are located adjacent to the side portions of the MR element and apply a bias magnetic field (see col. 17, lines 11-21); two electrode layers 18 that feed a current used for signal detection to the MR element, each of the electrode layers adjacent to one of the surfaces of each of the bias field applying layers; the two bias field applying layers are located off one of the surfaces of the MR element (as per claims 22 & 26); both of the two electrode layers overlap the one of the surfaces of the MR element; (as per claims 21 & 25) wherein the length of the region of overlap T3 is greater than zero and smaller than 0.15um, e.g.,  $0.05 \times 2 = 0.10$  (see col. 18, lines 30-41) which follows that the total overlap is greater than zero and smaller than 0.30 um.

As per claims 10, 20, 23-24, 27-28, the "method" as claimed is considered to be encompassed by the structure of the product as described, supra.

Although Aoki et al discloses a space between the electrodes, e.g., O-Tw, Aoki et al remains silent as to a specific dimension. As Aoki et al discloses some 24 embodiments, having various spacing ratios with respect to the overlap, and as the electrode spacing is in direct relationship with the track width of the MR head, it would have been considered obvious to one having ordinary skill in the art at the time the invention was made to have provided this dimension through at least routine engineering experimentation and optimization. As was readily apparent to a skilled artisan, a common goal in the art was to increase storage capacity and one way to do this was to decrease track width. As the electrode spacing is in direct correlation to the track width of the MR sensor, it would reasonably follow that decreasing the electrode spacing would result in decreased track width and therefore increased storage capacity. It would have been considered that optimizing electrode spacing, e.g., decreasing, and therefore the claimed spacing,

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i.e., “greater than zero and equal to or smaller than approximately 0.6  $\mu\text{m}$ ”, would have been encompassed by Aoki et al and the knowledge of a skilled artisan.

Moreover, absent a showing of criticality, i.e., unobvious or unexpected results, the relationships set forth in these claims are considered to be within the level of ordinary skill in the art. The law is replete with cases in which the mere difference between the claimed invention and the prior art is some range, variable or other dimensional limitation within the claims, patentability cannot be found.

It furthermore has been held in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range(s); see *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions; see *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

#### ***Allowable Subject Matter***

5. Claims 29-40 are allowable over the prior art of record.
6. The following is a statement of reasons for the indication of allowable subject matter: Applicant's affidavit filed under 1.132 has been considered and the Examiner agrees that the combination of features of having the total electrode layer overlap onto the surfaces of the MR element to be “smaller than 0.3  $\mu\text{m}$ ” and the space between the two electrode layers to be “equal

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to or smaller than approximately 0.4  $\mu\text{m}$ ” would overcome the rejection over Aoki (US Patent 6,587,315). As set forth in the affidavit, the criticality of having the electrode spacing equal to or smaller than approximately 0.4  $\mu\text{m}$  is shown to decrease the frequency of Barkhausen noise considerably over a larger spacing (see Table A in the affidavit).

### ***Response to Arguments***

7. Applicant's arguments filed 9/27/05 have been considered but they are not fully persuasive.

A...Applicant asserts that the claimed electrode spacing of “equal to or smaller than approximately 0.6 $\mu\text{m}$ ” is unobvious to one having ordinary skill in the art, and furthermore, provides unobvious and unexpected results over Aoki in view of the newly filed affidavit and the teachings of Aoki.

While the Examiner agrees that the teachings of Aoki would encompass at best a 1.24  $\mu\text{m}$  electrode spacing (MRT1) as pointed out by applicant, the accompanying affidavit does not persuade the Examiner to change his position. Actually, the data provided would actually *strengthen* the Examiner's position in that regard. According to the data (see Table A for example), the electrode spacing with respect to the frequency of occurrence of Barkhausen noise, does not significantly change between a spacing of 1.5  $\mu\text{m}$  to as small as 0.5  $\mu\text{m}$ , e.g., 13.2% to 13.0% of occurrence. From at least this data, the Examiner maintains his position that the teachings of Aoki et al and knowledge of a skilled artisan would encompass applicants' invention and the claimed electrode spacing.

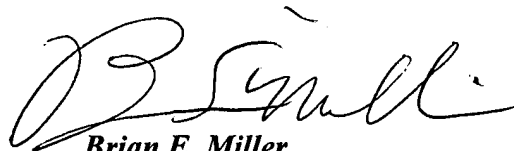
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian E. Miller whose telephone number is (571) 272-7578. The examiner can normally be reached on M-TH 7:15am-4:45pm (and every other friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Brian E. Miller**  
**Primary Examiner**  
**Art Unit 2652**

BEM  
October 14, 2005